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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/990,035	11/21/2001	Daniel Yellin	884.556US1	2764

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EXAMINER	
WANG, TED M	

ART UNIT	PAPER NUMBER
2634	

DATE MAILED: 02/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/990,035	YELLIN ET AL.	
	Examiner	Art Unit	
	Ted M Wang	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 December 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,7-12,18,19 and 24-27* is/are rejected.

7)☒ Claim(s) *3-6,13-17,20-23 and 28-31* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 3-6 and 17 are rejected to because of the following informalities:

- In claim 3, line 3, change "users" to – user – after "said".
- In claim 17, line 3, change "the" to – a --.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 2, 7-12, 26, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yellin et al. (US 6,603,823) in view of Levin et al. (US 2003/0021334 A1).

- With regard claims 1, 9, 26, and 27, which are related detector and method claims, Yellin et al. discloses a multi-user detector comprising:

  a channel estimator (Fig.2 and Fig.3A element 30, column 1 lines 58-62, column 10 lines 17-21, column 11 lines 6-10) to estimate actual channel taps (Fig.2 and Fig.3A element 36, column 1 line 63 – column 2 line 7, and column 10 lines 17 –

21, and column 11 lines 6-10) associated with users of interest based on a receive signal; and

a channel tap interpolator (column 2 lines 61 – column 3 line 30) to generate interpolated channel taps (column 12 lines 1-65) for a first user of interest.

Yellin et al. discloses all of the subject matter as described above except for specifically teaching at least one actual channel tap associated with said first user of interest occurs at a non-integer multiple of a chip period from a sampling reference point, said interpolated channel taps occurring at integer multiples of the chip period from the sampling reference point.

However, Levin et al. teaches that at least one actual channel tap associated with said first user of interest occurs at a non-integer multiple of a chip period from a sampling reference point, said interpolated channel taps occurring at integer multiples of the chip period from the sampling reference point (Fig.5 element 522, Fig.6, and page 5 paragraphs 62-65).

It is desirable to include at least one actual channel tap associated with said first user of interest occurs at a non-integer multiple of a chip period (page 5 paragraph 64) from a sampling reference point, said interpolated channel taps occurring at integer multiples of the chip period (page 5 paragraph 64) from the sampling reference point in order to improve the pilot interference cancellation (paragraph 61 lines 1-3). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the apparatus/method as taught by Levin et al. in which, at least one actual channel

tap associated with said first user of interest occurs at a non-integer multiple of a chip period from a sampling reference point, said interpolated channel taps occurring at integer multiples of the chip period from the sampling reference point, into Yellins' channel taps interpolator so as to improve the pilot interference cancellation.

- With regard claims 2 and 12, Yellin et al. discloses all of the subject matter as described above except for specifically teaching said channel tap interpolator generates a set of interpolated taps for each actual tap associated with said users of interest that occurs at a non-integer multiple of a chip period from the sampling reference point.

  However, Levin et al. teaches that said interpolator generates a set of interpolated taps for each actual tap associated with said users of interest that occurs at a non-integer multiple of a chip period from the sampling reference point (Fig.5 element 522, Fig.6, and page 5 paragraphs 62-65).

  It is desirable to include said interpolator generates a set of interpolated taps for each actual tap associated with said users of interest that occurs at a non-integer multiple of a chip period from the sampling reference point in order to improve the pilot interference cancellation (paragraph 61 lines 1-3). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the apparatus/method as taught by Levin et al. in which, at least one actual channel tap associated with said first user of interest occurs at a non-integer multiple of a chip period from a sampling reference point, said

interpolator generates a set of interpolated taps for each actual tap associated with said users of interest that occurs at a non-integer multiple of a chip period from the sampling reference point, into Yellins' channel taps interpolator so as to improve the pilot interference cancellation.

- With regard claims 7 and 11, which are related detector and method claims, Yellin et al. further discloses that channel tap interpolator includes an interpolation filter (column 2 lines 61-67 and column 3 lines 48-67).
- With regard claims 8 and 10, which are related detector and method claims, Yellin et al. further discloses that channel estimator estimates actual channel taps for at least one base station of interest, said at least one base station of interest being associated with at least one user of interest (column 5 lines 48-60).

4. Claims 18, 19, 24, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Levin et al. (US 2003/0021334 A1) in view of Yellin et al. (US 6,603,823).

- With regard claim 18, as shown in figures 2 elements 104 and 106 and figures 5 and 6, Levin et al. discloses a receiver system for use in a CDMA-based communication system, comprising:

  a de-spreader to de-spread a receive signal (Fig.5 elements 524, 540, 544) using a de-spreading sequence associated with a desired user (page 6 paragraph 67), said receive signal including code modulated signal components for multiple users that have overlapping signal spectrums (Fig.1 and 2 and page 2 paragraphs 24-28); and

a de-spreading sequence determination unit (Fig.5 element 410 and paragraph 53) to generate said de-spreading sequence (page 6 paragraph 67), said de-spreading sequence determination unit including an interpolator (Fig.5 element 522 and paragraph 62) to determine interpolated taps for a user of interest when at least one actual tap associated with the user of interest occurs at a non-integer multiple of a chip period from a sampling reference point, wherein said interpolated taps occur at integer multiples of said chip period from the sampling reference (Fig.5 element 522, Fig.6, and page 5 paragraphs 62-65).

Levin et al. discloses all of the subject matter as described above except for specifically teaching that the interpolator is a channel tap interpolator.

However, Yellin et al. teaches a channel tap interpolator (column 2 lines 61 – column 3 line 30) related to channel estimators in wireless communication systems generally and to such channel estimators that operate on data and pilot signals.

It is desirable to include a channel tap interpolator in order to improve channel estimator without using any of a priori statistical information about the channel (column 1 lines 58-62). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the apparatus/method as taught by Yellin et al. in which, including a channel tap interpolator, into Levins' despreader so as to improve channel estimator without using any of a priori statistical information about the channel.

- With regard claim 19, Levin et al. discloses all of the subject matter as described above except for specifically teaching that channel tap interpolator includes an interpolation filter.

  However, Yellin et al. teaches that channel tap interpolator includes an interpolation filter (column 2 lines 61-67 and column 3 lines 48-67).

  It is desirable that channel tap interpolator includes an interpolation filter in order to improve channel estimator without using any of a priori statistical information about the channel (column 1 lines 58-62). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the apparatus/method as taught by Yellin et al. in which, channel tap interpolator includes an interpolation filter, into Levins' despreader so as to improve channel estimator without using any of a priori statistical information about the channel.
- With regard claim 24, Levin et al. further discloses that receiver system is located within a handheld communication (Fig.2 elements 104 and 106, page 1 paragraph 11, and page 2 paragraph 28).
- With regard claim 25, Levin et al. further discloses that receiver system is located within a cellular base station (Fig.2 elements 104 and 106, page 1 paragraph 11, and page 2 paragraph 28).

Allowable Subject Matter

5. Claims 3-6, 13-17, 20-23, and 28-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and rewritten to overcome the objection(s) set forth in this Office action.

Conclusion

6. Reference(s) US 6,034,986, 6,289,041, and "Multiple access interference resistant channel acquisition for wideband CDMA signals",Tripathi;Vehicular Technology Conference Proceedings, 2000. VTC 2000-Spring Tokyo. 2000 IEEE 51st, Volume: 2, 15-18 May 2000, Page 956 – 960, vol.2 are cited because they are put pertinent to the channel estimator. However, none of references teach detailed connection as recited in claim.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ted M. Wang whose telephone number is 571-272-3053. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ted M Wang
Examiner
Art Unit 2634

Ted M. Wang

SHUWANG LIU
PRIMARY EXAMINER